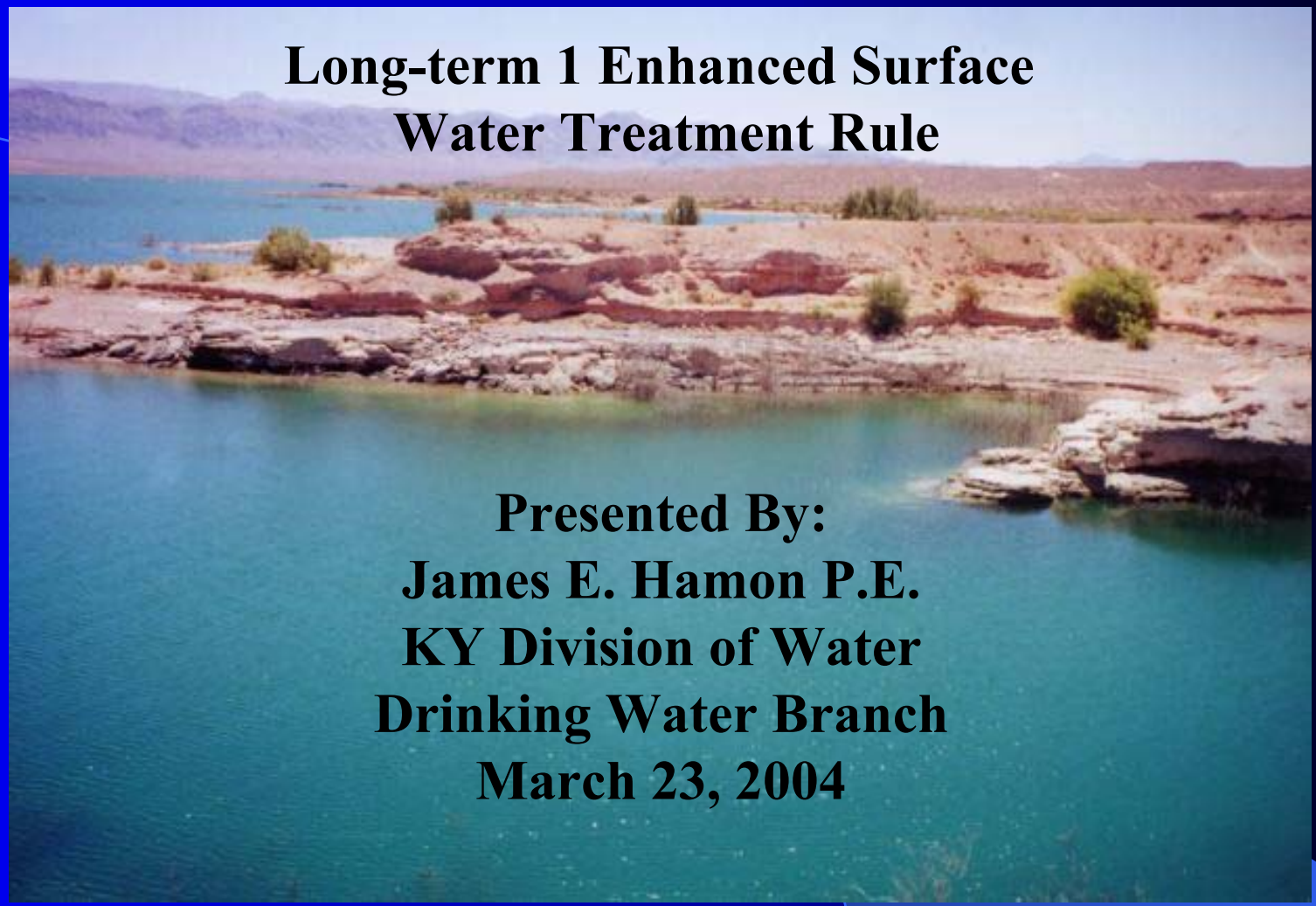

Long-term 1 Enhanced Surface Water Treatment Rule

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Who does this rule effect?

- Public Water Systems (PWS's) that use surface water or ground water under the direct influence of surface water (GWUDI) and serve fewer than 10,000 persons.


Operations staff
EPA

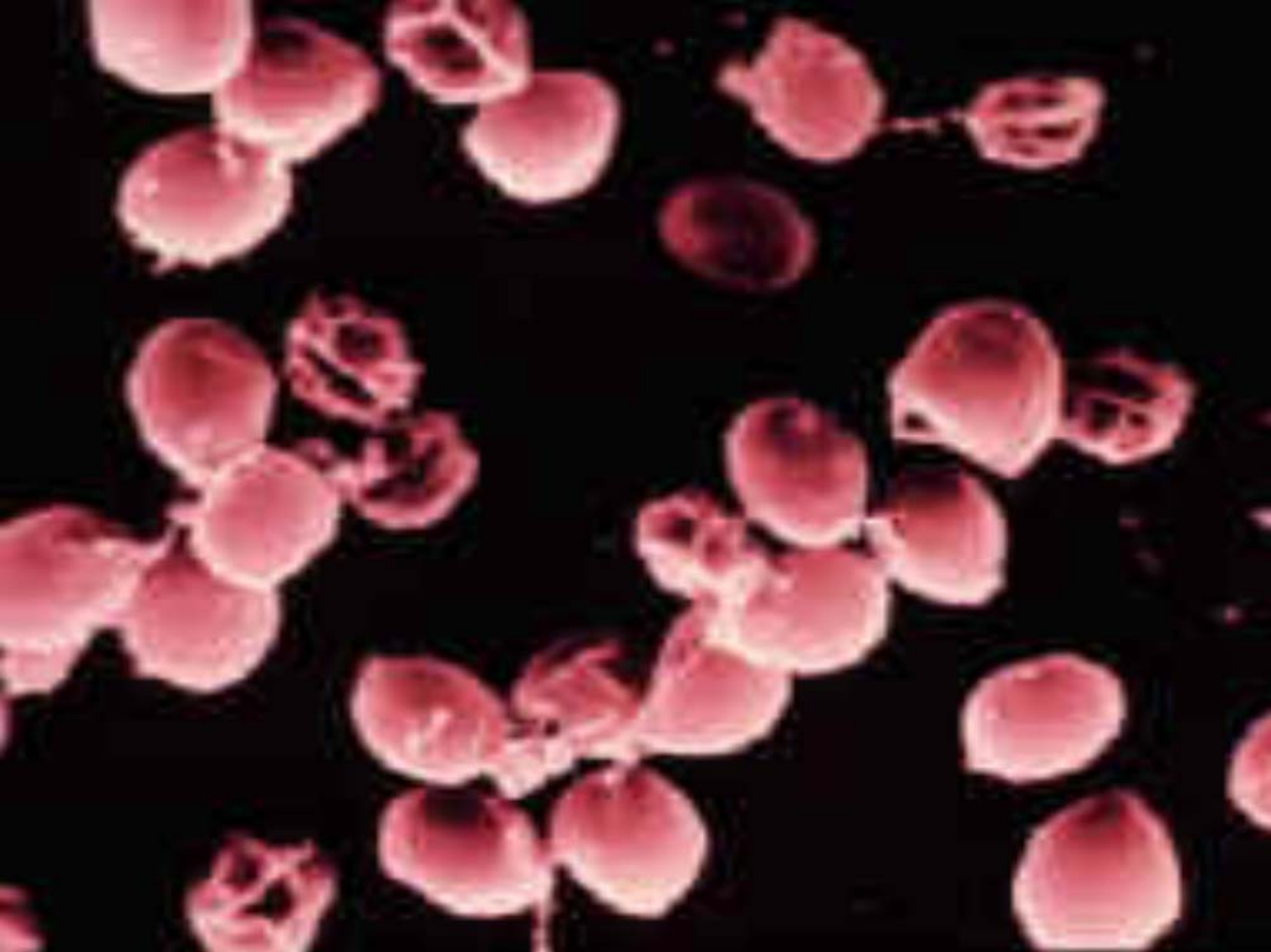
Why is EPA promulgating this rule?

- The presence of microbial contaminants in drinking water is a substantial health concern

- Physical removal is critical to the control of *Cryptosporidium* which is highly resistant to standard disinfection practices.

Outbreaks of Cryptosporidiosis in the US

- Nevada, Oregon, Georgia and Wisconsin
- The Milwaukee outbreak caused 400,000 people to experience intestinal illness. Some 4,000 people were hospitalized and at 50 died.



What is Cryptosporidium

- **A protozoan parasite found in humans, other mammals, fish, birds and reptiles.**
- **Multiplies in gastrointestinal tracts of infected animal which excretes *oocysts* which are tiny spore-like organisms 4-6 microns in diameter that carry within them infective sporozoites.**

Requirements in this rule

- All surface water and GWUDI systems serving fewer than 10,000 people must be able to achieve 2-log (99%) removal of *Cryptosporidium*.
- Conventional and direct filtration systems must comply with specific combined filter effluent turbidity levels.

Requirements cont.

- Conventional and direct filtration systems must continuously monitor individual filter turbidity and perform follow-up activities if this indicates a potential problem.
- Systems must develop a disinfection profile unless they can demonstrate DBP levels at 80% of the MCL or less.

Requirements cont.

- Systems considering a significant change to their disinfection practice must develop a disinfection inactivation benchmark of their existing level of microbial protection and consult with the state before any change.
- Finished water reservoirs for which construction begins after the rules effective date must be covered.
- Unfiltered systems must comply with updated watershed control requirements.

Removal of Cryptosporidium

- EPA set a MCLG for *Cryptosporidium* at zero. This requires either an MCL or treatment technique to be put in place.

- 2-log removal *Cryptosporidium* is to be achieved by treatment technique. Detailed studies have shown that plants that employ coagulation, sedimentation and filtration can achieve this removal when meeting specific turbidity limits.

Combined Filter Effluent

- Strengthened performance for conventional, direct and alternative filtration systems.
- For conventional and direct filtration systems, turbidity levels of representative samples must be less than or equal to 0.3 NTU in 95% of the measurements taken each month.
- The turbidity levels of these samples must at no time exceed 1 NTU.

Combined Filter Effluent Cont.

- Plants meeting these performance goals are presumed to achieve at least 2-log Crypto removal.
- Slow sand and DE plants are presumed to achieve at least a 2-log removal if they continue to meet the SWTR performance requirements.
- Alternative filtration systems must exhibit to the state that their system can achieve 2-log Crypto removal.

Individual Filter Monitoring

- **Continuously (at least every 15 minutes) monitor individual filter turbidity with results kept for three years.**
- **Trigger #1: If turbidity exceeds 1.0 NTU in two consecutive 15 minute measurements the system must indicate the filter number, date, time, value of measurement and reason for exceedance on the MOR.**
- **If this occurs three months in a row on the same filter the utility must perform a filter self assessment within 14 days of exceedance.**

Individual Filter Self Assessment

- Assessment of filter performance
- Development of filter profile
- Identify and prioritize factors limiting filter performance
- Assessment of the applicability of corrections
- Preparation of self-assessment report

Filter Monitoring Cont.

- Trigger #2: If a system exceeds 2.0 NTU in two consecutive measurements 15 minutes apart in two months in a row, the system must schedule a Comprehensive Performance Evaluation (CPE) not later than 60 days after the trigger.

- The CPE must be completed no later than 120 days following the filter exceedance trigger.

Filter Monitoring Cont….

- Systems with two filters may monitor combined filter effluent turbidity continuously, in lieu of individual filter turbidity.

- Should your turbidimeter or recording device malfunction you have fourteen days before a violation occurs. In this case monitor turbidity on each filter every four hours.

Driving force behind this requirement

- Poor Performance of one filter may be masked by optimal performance of the remaining filters without exceeding CFE turbidity standards.
- Individual filter spikes are susceptible to turbidity spikes of short duration that may not be captured by four hour CFE readings.

Disinfection Profiling and Benchmarking

- Monitor disinfection residual concentration, water temperature in Celsius , pH and contact time each day
- Calculate Giardia lamblia inactivation for each day
- Plot graphically the daily inactivation.
- To be kept indefinitely

Profiling and Benchmarking Cont…

- System profile may be unnecessary if TTHM and HAA5 data is submitted that:
  - -Is taken during the month of warmest water temperature
  - -Is taken at the point of maximum retention
  - -Reports levels of TTHM and HAA5 of less than 0.064 mg/L and 0.048 mg/L respectively (80% of MCL or less)

Profiling and Benchmarking Cont…

- Any system that proposes a significant change to their disinfection practice must determine their disinfection benchmark (the average microbial inactivation during the month of the lowest inactivation.

- Information to be supplied to the state:
  - -Description of the proposed change
  - -Disinfection profile with supporting data
  - -Analysis of how the proposed change will affect current levels of disinfection.

Ground Water Under Direct Influence of Surface Water

- Includes *Cryptosporidium* as another pathogen whose presence would indicate that source is under direct influence of surface water. (GWUDI)

- The final Surface Water Treatment Rule requires that systems with source water found to be GWUDI are subject to the filtration and disinfection requirements.

Unfiltered Systems

- Requirements for surface water or GWUDI systems that do not provide filtration are modified by adding *Cryptosporidium* in the watershed control provisions everywhere Giardia Lamblia is mentioned.

- SWTR contains specific conditions that must be met in order to avoid filtration:
  - -Good source water quality
  - -Disinfection requirements
  - -Absence of water borne disease outbreaks
  - -Compliance with the Total Coliform Rule
  - -A viable watershed control program

Finished Water Reservoirs

- **All finished water reservoirs, holding tanks, or storage facilities for which construction begins after March 15, 2002 must be covered.**

- **Uncovered finished water reservoirs or tanks have not been allowed in KY in the last 15 years.**

Compliance Schedules for LT1ESWTR

- -Cover finished water reservoirs — March 15,2002
- -Comply with updated watershed control requirements — January 1, 2005
- -Begin Disinfection profile — July 1, 2003
- -Complete Disinfection profile — July 1, 2004
- -CFE turbidity limits — January 1, 2004
- -Individual filter monitoring — January 1, 2004

The End